Amendments to the Claims:

Kindly amend claim 5 and add new claim 18 as follows.

The following listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claims 1 - 4 have been cancelled.

5. (Currently Amended) The implicit function rendering method of a nonmanifold, characterized in that:

(1) an input nonmanifold curved surface is divided along a branch line, broken down into curved surface patches having no branches;

(2) numbers i are allocated to the patches in an obtained order, a front and a back of each patch are distinguished from each other, a number i^+ is given to the front, and a number i^- is given to the back;

(3) a space is sampled by a lattice point p; and

Euclid distance $d_E(p)$ to the curved surface and number i(p) of a surface of a nearest point are allocated to the lattice point;

(4) for each lattice point p, $i(p_n)$ is determined at six adjacent points p_n, and groups of $(i(p), i(p_n))$ where $i(p) \neq i(p_n)$ are enumerated;

(5) a group of new numbers are substituted for the group of numbers allocated above, but if the numbers which are first i^+ and i^- become the same numbers as a result of the substitution, no substitution is carried out for a combination thereof, whereby numbers are arrayed in order from 0 after said substitution;

(6) in accordance with a substitution table, a region number i(p) is rewritten at each lattice point p, and an implicit volume function of a real value is comprised of the obtained volume region number i(p) and the Euclid distance $d_E(p)$ to the surface at each voxel, wherein

$$d_E = \sqrt{(x-X)^2 + (y-Y)^2 + (z-Z)^2}$$

where the coordinate (x, y , z) is a lattice point, and the coordinate (X, Y, Z) is the point closest to a curved surface from the lattice point; and

(7) rendering and displaying an implicit function curved surface from the implicit volume function of the real value.

6. (Previously Presented) The implicit function rendering method according to claim 5, characterized in that:

a distance d^i_s included in a distance i is as follows:

$d^i_s \in [D_s i, D_s(i+1))$... (6)

wherein D_s is a width of each divided region of a real valued space representing a distance; and

in a position p of each voxel, a region distance $f_s(p)$ is calculated from $d_E(p)$ and i(p) by the following equation:

$f_s(p)=\min(d_E, 2^B-\varepsilon)+2^B i(p)$ ... (7),

$\varepsilon(>0)$ is set to a minute positive real number to round down $d_E(p)$ so that fs(p) can be included in a half-open section of (6).

7. (Previously Presented) The implicit function rendering method according to claim 5, characterized in that:

only when the followings are all satisfied,

$u \in (2^B i, 2^B(i+1)$ ... (8)

$v \in [2^B j, 2^B(j+1))$ ... (9)

$0<(u-2^B i)+(v-2^B j)<\alpha w$ ... (10)

but i, j $(0 \le i \le j \le n-1)$, $\alpha(\ge 1)$,

wherein w is a space between two optional sample points; and u and v $(u \le v)$ are values, respectively, there is a surface between these two points

wherein with respect to two sample points A and B, the designations i, j, u, v, n, and α are defined as follows

i = region number of the point A,

j = region number of the point B,

u = region distance of the point A,

v = region distance of the point B,

n = total number of regions in which the region code distance is defined,

α = a parameter that makes it possible to generate a cured surface between the points A and B, even if the curved surface exists between the points A and B , and the points closest to the curved surface do no conform to each other, and

wherein 2^B is a range of permissible region distance values in one dimension.

8. (Previously Presented) The implicit function rendering method according to claim 5, characterized in that:

a surface position q ($\in[0, 1]$) is normalized so that a value can be on a lattice point of u when q=0 and can be on a lattice point of v when q=1; and the position q where there is a surface is obtained by the following equation:

$q=(u-2^Bi)/((u-2^Bi)+(v-2^Bj)$ ... (11), wherein 2^B is a range of permissible region distance values in one dimension.

Claims 9 - 17 have been cancelled.

18. (NEW) The implicit function rendering method of a nonmanifold, characterized in that:

(1) an input nonmanifold curved surface is divided along a branch line, broken down into curved surface patches having no branches;

(2) numbers i are allocated to the patches in an obtained order, a front and a back of each patch are distinguished from each other, a number i^+ is given to the front, and a number i^- is given to the back;

(3) a space is sampled by a lattice point p; and

Euclid distance $d_E(p)$ to the curved surface and number i(p) of a surface of a nearest point are allocated to the lattice point;

(4) for each lattice point p, $i(p_n)$ is determined at six adjacent points p_n, and groups of $(i(p), i(p_n))$ where $i(p)\neq i(p_n)$ are enumerated;

(5) a group of new numbers are substituted for the group of numbers allocated above, but if the numbers which are first i^+ and i^- become the same numbers as a result of the substitution, no substitution is carried out for a combination thereof, whereby numbers are arrayed in order from 0 after said substitution;

(6) in accordance with a substitution table, a region number i(p) is rewritten at each lattice point p, and an implicit volume function of a real value is comprised of the obtained volume region number i(p) and the Euclid distance $d_E(p)$ to the surface at each voxel, wherein

$$d_E = \sqrt{(x-X)^2 + (y-Y)^2 + (z-Z)^2}$$

where the coordinate (x, y , z) is a lattice point, and the coordinate (X, Y, Z) is the point closest to a curved surface from the lattice point; and

(7) rendering an implicit function curved surface from the implicit volume function of the real value to a display.